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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/585,472	06/02/2000	Michiaki Sakamoto	157330/99	6609

21254 7590 08/30/2002
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EXAMINER

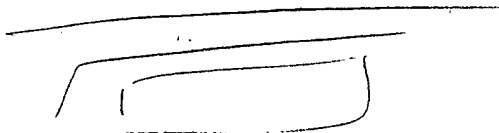
RUDE, TIMOTHY L

ART UNIT PAPER NUMBER

2871

DATE MAILED: 08/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.



Office Action Summary

Application No.

09/585,472

Applicant(s)

SAKAMOTO, MICHIAKI

Examiner

Timothy L Rude

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 30 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 1-7 are amended and the objection to claim 7 is withdrawn. Claims 11-22 are added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabe USPAT 6,162,654, in view of Zhong et al (Zhong) USPAT 5,994,721, Kashiwazaki et al (Kashiwazaki) USPAT 5,922,401, and Lee (Applicant's IDS entered 29 July 2002).

As to claims 1, 2, and 15, Kawabe discloses in Figure 8, an active matrix liquid crystal display (LCD) with a passivation layer, 7, over the TFT and under the color filter, 41. Kawabe also discloses an alignment layer, 10, (Applicant's overcoat layer) disposed over the color filters.

Kawabe does not explicitly disclose a color filter disposed directly on the active matrix substrate, nor does Kawabe disclose removal of the passivation layer from the light transmission region.

Zhong discloses in Figures 6a and 6c, (col. 3, line 35 through col. 4, line 10 and col. 8, line 22 through col. 15, line 10) a conventional red-green-blue (RGB) active matrix liquid crystal display (LCD) configuration including a first substrate and a second substrate, at least one of the first and second substrates being transparent; a liquid crystal layer put between the first and second substrates; a color filter, said first substrate including a plurality of scanning lines; a plurality of signal lines crossing the scanning lines in a matrix manner; a plurality of thin film transistors formed at intersections of the scanning lines and signal lines, respectively; a pixel electrode connected to said plurality of thin film transistors, said second substrate including a counter electrode, liquid crystal molecules being driven by an electric field between said pixel electrode and said counter electrode to thereby make a display. Zhong discloses, in Figure 6c, (col. 3, line 35 through col. 4, line 10 and col. 8, line 22 through col. 15, line 10) a pixel electrode, 3, arranged on said color filter and connected to said thin film transistors through a contact hole provided in said color filter, 101; and gate insulating layers, 21, of said thin film transistors is removed in a light transmission region within pixels surrounded by said scanning lines and said signal lines.

Zhong does not explicitly disclose and does not preclude a passivation film for protecting said thin film transistors (TFTs). The use of passivation films to protect TFTs is well known in the art of liquid crystals, and the use of overcoat layers to protect color

filters (and to protect the LC material from contamination by the color filters) is well known in the art of liquid crystals.

Zhong is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to dispose color filters directly on the active matrix substrate in the light transmission region within pixels in order to achieve adequate color filter layer thickness to minimize pixel electrode capacitance (col. 6, lines 1-65, especially lines 36-40).

Kashiwazaki teaches in Figures 5A through 5K the method of removing the gate insulating film, 103, and the passivation film, 110, from the light transmission area and subsequently disposing the color filter, 113, directly onto the active matrix substrate, 101 (col. 20, line 52 through col. 21, line 37) to avoid defects such as color mixing and color irregularity (col. 21, lines 37-47).

Kashiwazaki is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to remove the gate insulating film and the passivation film from the light transmission area and subsequently disposing the color filter directly onto the active matrix substrate to avoid defects such as color mixing and color irregularity.

Lee teaches the use of an overcoat layer between the color filter and the ITO electrode layer. Motivations known in the art include, leveling, better adhesion of the ITO layer, protection of the color filter, and reduced contamination of the LC material by the color filter (Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify a RGB active matrix LCD configuration of Kawabe with the overcoat layer of Lee and a passivation layer by removing the gate insulating layer and the passivation layer from the light transmission region within pixels prior to depositing the color filter on the TFTs and directly on the active matrix substrate in order to achieve adequate color filter layer thickness to minimize pixel electrode capacitance of Zhong while avoiding defects such as color mixing and color irregularity per Kashiwazaki.

As to claim 3 and 8, Zhong teaches the use of a color filter around said contact hole that is thinner than the color filter in said light transmission region (Figure 6c).

As to claims 4, 5, 9 and 10, Zhong teaches the use of a color filter consisting of a photosensitive organic film (resist) with a color pigment or dye (col. 16, lines 43-46) that is substantially flat on the top surface (as illustrated in Figure 6c), therefore a difference in level generated on a surface of the organic film being not more than 0.3 μm .

As to claim 6, the conventional method of manufacturing a RGB active matrix liquid crystal display device comprises steps of: forming a plurality of scanning **lines** on a first substrate; forming a plurality of signal lines crossing the plurality of scanning lines in a matrix manner; forming a plurality of thin film transistors at intersections of the plurality of scanning lines and the plurality of signal lines, respectively; forming a pixel

electrode connected to said thin film transistors; forming a counter electrode on a second substrate; injecting liquid crystal between said first substrate and said second substrate and sealing the liquid crystals, wherein said method further comprising the steps of: forming a passivation film to protect each of said thin film transistors. The additional steps of removing part of a gate insulating layer and said passivation film of each of said tin film transistors in a region surrounded by said signal lines and said scanning lines; forming a color filter made of a photosensitive color resist; and forming a transparent conductive film are obvious given the structure.

As to claim 7, the conventional method of manufacturing a RGB active matrix liquid crystal display device comprises steps of: forming a plurality of scanning lines on a first substrate; forming a plurality of signal lines crossing the plurality of scanning lines in a matrix manner; forming a plurality of thin film transistors at intersections of the plurality of scanning lines and the plurality of signal lines, respectively; forming a pixel electrode connected to said thin film transistors; forming a counter electrode on a second substrate; injecting liquid crystal between said first substrate and said second substrate and sealing the liquid crystals, wherein said method further comprising the steps of: forming a passivation film to protect each of said thin film transistors. The additional steps of removing part of a gate insulating layer and said passivation film of each of said tin film transistors in a region surrounded by said signal lines and said scanning lines; forming a color filter made of a photosensitive color resist; forming an overcoat layer on said color filter; patterning said overcoat laver; forming a contact hole

by patterning said color filter while using said overcoat layer as a mask; and forming a transparent conductive film are obvious given the structure.

As to claim 11, Given the structure of Zhong (Figure 6c) and a passivation layer on the TFT, the vias, 35, formed in the color filters would necessarily be also formed in the passivation layer in order to allow electrical contact with source electrodes, 31.

As to claim 12, Zhong discloses a substantially flat color filter.

As to claim 13, Zhong discloses a gate insulation layer with a hole corresponding to the pixel opening that is filled with said color filter.

As to claim 14, Given the structure of Zhong (Figure 6c) and the passivation layer on the TFT of Kawabe, the color filter extends (as illustrated in Figure 6c) and it would cover said transistor with an intervention of said passivation film.

As to claim 16, Zhong discloses signal lines and a color filter terminating above the signal line in Figure 1.

As to claims 17-22, the method of manufacturing recitations of forming, providing, extending, etc. would have been obvious given the device structures above.

Response to Arguments

3. Applicant's arguments filed 30 April 2002 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) The examiner is engaging in prohibited hindsight and the examiner's conclusion is erroneous and based upon a misunderstanding of the invention wherein the use of a passivation film to protect TFTs is well known in the art of liquid crystals.

(2) There is no motivation to teach or suggest modification of Zhong to result in the removal of the passivation layer in the light transmission region.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Zhong teaches a color filter that is explicitly disposed directly upon the active matrix substrate within the pixel region (col. 6, lines 36-40). There is no motivation or suggestion to put a passivation layer under the color filter of Zhong (where it would do no good), but there is a long-standing practice in the art of liquid crystals to put a passivation layer on the TFTs. As proof of examiner's claim

that the practice of putting a passivation layer on the TFTs is indeed long-standing, Applicant's IDS entered 29 July 2002 includes Kikuo et al (Kikuo) Japanese Patent Abstract Publication 04-194823, dated 14 July 1992, includes such a passivation layer. This merely supports and examiner's First Action Rejection and does not constitute new grounds of rejection. However, new grounds of rejection are provided above.

(2) It is respectfully pointed out that removal of the passivation layer is a process limitation in a device claim. The structure of Zhong has no layers in the light transmission region between the color filter and the substrate. It would be obvious to those having ordinary skill in the art of liquid crystals to achieve that structure by avoiding the placement of the passivation layer in that region or by removing said passivation layer from that region, if it were so disposed in a prior step. Therefore, the examiner maintains the claimed invention would have been obvious to those having ordinary skill in the art of liquid crystals in view of the invention of Zhong. However, new grounds of rejection are provided above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William L Sikes can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

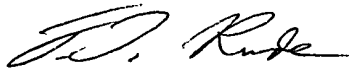
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746-8745 for regular communications and (703) 308-7725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



Timothy L Rude
Examiner
Art Unit 2871

TLR
August 23, 2002



TOANTON
PRIMARY EXAMINER

Since, as a result of examining the present application, the following reasons for rejection have been ascertained, notification of these are provided herewith in accordance with the stipulations of Article 63 of the Patent Law. If any Opinions or Amendments are necessary, they should be submitted by June 30, 2002 (This deadline may be extended in 1 month increments, concerning which there will be no separate notice of approval).

Reason

1. The invention of the present application relates to a liquid crystal display device and method of manufacture. In comparing the substrate, liquid crystal, glass filter and facing electrodes referred to in Claims 1 through 6 of the present application with the color filter, joint electrodes, TFT, liquid crystal, substrate, facing electrodes, contact holes and insulation film contained in the Detailed Explanation and Drawings of Japanese Laid Open Patent Publication Hei 4-194823 (issued July 14, 1992: hereafter referred to as Citation 1), since the invention of the present application could have easily been invented by one of ordinary skill in the Art of the technology sector to which the invention belongs on the basis of Citation 1, in accordance with Patent Law Article 29 Section 2, a patent may not be granted.

2. In comparing the overcoat layer of Claims 2-5 and Claim 7 of the Scope of Claims of the present application with the color filter, joint electrodes, TFT, liquid crystal, substrate, facing electrodes, contact holes and insulation film of Citation 1, as well as the overcoat layer and color filter of Korean Laid Open Patent Application 1993-4788 (issued March 23, 1993), hereafter referred to as Citation 2), since the invention of the present application could have been easily invented by one of ordinary skill in the Art of the technology sector to which the invention belongs, of the present application could have easily invented on the basis of Citations and 2, in accordance with Patent Law Article 29 Section 2, a patent may not be granted.

Addenda

Addendum 1

Japanese Laid Open Patent Publication Hei 4-194823

Addendum 2

Korean Laid Open Patent Application 1993-4788